

REMARKS

CLAIM REJECTIONS 35 USC 103

Claims 1-23 have been rejected as being obvious over Tangen in view of Hoshuyama in further view of Moore.

Applicant respectfully traverses the Examiner's rejection for the reasons as described below.

The Examiner cited Moore as teaching the step of "gathering overlapping information." Applicant respectfully disagrees with the Examiner's analysis, but Applicant believes that point to be moot in view of the current amendment deleting that limitation from Claim 1. Applicant believes that in view of the amendment to Claim 1, only Tangen and Hoshuyama remain as prior art.

In a telephone conversation on October 18, 2010, the undersigned briefly discussed the cited prior art with the Examiner. As a follow up to that conversation, Applicant clearly sets out his argument distinguishing the combined teachings of the Tangen and Hoshuyama.

Neither Tangen nor Hoshuyama Teach or Suggest the Limitation of Nanoscale

The Examiner has taken the position that both Tangen and Hoshuyama teach a nano imaging apparatus. Specifically, the Examiner has cited Tangen as teaching a "nano-imaging apparatus" and Hoshuyama as teaching "a nano imaging apparatus comprising optical elements in a nanometer scale..."

In response, Applicant submits that neither Tangen nor Hoshuyama teach or suggest a "nano imaging apparatus."

The Tengen reference is directed to reducing the size of a micro camera.
As Applicant stated numerous times:

"...The difference [between nano and micro] is not merely one of scale. If that were the case, then even Tengen would be unpatentable in light of an already known telescope array, the Very Large Array."

"Applicant solves unique problems that Tengen does not even attempt to solve. The Tengen patent is a *micro* camera operating on Newtonian principles as do all other cameras. Applicant's invention is a *nano*-imaging device/camera as required in Claim 1 and solves problems unique to photon and wave behavior at quantum levels, as recited in Claims 16-20. The inventive *nano*-camera admits only certain wavelengths of light based on aperture variation and diffraction at this sub-micron level. It therefore solves problems unique to *nano*-level light..."

Hoshuyama does not Teach or Suggest Optical Elements of Nanoscale

As mentioned above, the Examiner has cited Hoshuyama as teaching "a nano imaging apparatus comprising optical elements in a nanometer scale..." Applicant submits that Hoshuyama does not teach or suggest a "nano imaging apparatus" or "optical elements in nanometer scale."

As described, the Hoshuyama reference is directed to *improving existing image sensors* by utilizing dichroic mirrors to further separate light incoming through a single opening. This increases photon utilization efficiency and reduces false color that is sometimes introduced as a result of color interpolation. Applicant emphasizes that the invention disclosed by Hoshuyama does nothing to the size of the camera. Hoshuyama's improvement lies in the fact that more information is gleaned from a signal than would be acquired in prior cameras.

However, there is nothing in the Hoshuyama reference that teaches, suggests or even alludes to reducing the camera size at all – and certainly not to *nanoscale*.

Applicant further clarifies that the microlens described in Hoshuyama is standard in existing digital cameras – and is not part of the Hoshuyama invention.

**Hoshuyama does not Teach or Suggest an Optical Element...Having
More Than One Pixel Per Optical Element**

The Examiner further stated that Hoshuyama teaches "optical elements in nanometer scale having more than one pixel per optical element." Applicant respectfully disagrees with the Examiner's assertion.

Hoshuyama describes improving the well-known Bayer Array (see col. 1, line 50) by adding dichroic mirrors as described above. The improvement described by Hoshuyama lies in the fact that the inventive arrangement gathers more information than other cameras using the well-known Bayer Array. However, Hoshuyama, does not by any means teach or suggest a device that has more than one pixel per optical element. Rather, the light entering through the optical element described by Hoshuyama contributes to one pixel – and not to "more than one" as set forth in Claim 1.

It Would Not be Obvious To Combine Tangen and Hoshuyama

The Examiner further stated that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to reduce the micro-camera of Tangen to the nano level of Hoshuyama."

As stated in their previous remarks, Applicant submits that one of ordinary skill in the art would not be motivated to combine the Tangen and Hoshuyama.

Specifically, Hoshuyama teaches a system for *enhancing* photon utilization of standard-sized cameras (it is not and does not even claim to be a camera), whereas Tangen is directed to *reducing* the size of standard cameras. Furthermore, one of ordinary skill in the art reading Tangen and Hoshuyama would not be motivated to combine the teachings thereof in order to arrive at a nano-scaled device. There is no teaching or suggestion in those references that would take account of necessary requirements (e.g. more than one pixel per optical element) for producing a nano-scaled device.

**The Combination of Tangen and Hoshuyama would not Result in the
Invention set forth in the Instant Claims**

Applicant submits that even if one of ordinary skill in the art would try to combine the Tangen and Hoshuyama references – *doing so would not yield the invention set forth in Claim 1*. That is because it would be technically and physically impossible to combine the teachings of Tangen and Hoshuyama. In order for Hoshuyama to resolve three different colors from one signal, at least three dichroic mirrors - set at 45 degree angles are necessary in order to transfer the light to all of the light receiving surfaces. The amount of space required for this arrangement would not be feasible in nano (or even micro) sized cameras. Thus, even if one were to combine the cited references – one would not achieve the invention set forth in Claim 1.

Said differently, the space necessitated by Hoshuyama's dichroic mirrors make it impossible and, in fact, teach away from a nano or even micro-sized device.

Claims 2-23, which depend from Claim 1 are similarly limited and they are therefore believed to be allowable as well.

In view of the fact that the prior art references – either individually or in combination – do not teach or suggest “A nano-imaging apparatus comprising multiple optical elements of sub-micron, nanometer scale having more than one pixel per optical element...,” Applicant believes that the application is in condition for allowance.

Applicant believes that the invention is novel and allowable over the prior art. In the event that Applicant does not receive a Notice of Allowance, the Examiner is kindly reminded of Applicant's request in the above-mentioned telephone conversation requesting the Examiner to issue an Advisory Action setting forth the Examiner's responses to the above recited arguments.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read 'T. Rotberg', followed by a long horizontal flourish.

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